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# CANADIAN PATENT

## GROOVED PIPE COUPLING

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No. OF CLAIMS 7

This invention relates to couplings for grooved pipes, culverts, and the like.

This pipe coupling is designed to connect together adjacent ends of annularly grooved pipes and the like of similar diameters. The pipe ends to be connected together are aligned and butted, and normal clamps for interconnecting the ends of aligned pipes are not satisfactory for annularly grooved pipes. These pipes have grooves or corrugations extending around the surfaces of the pipes. The grooves may be in the form of axially spaced endless grooves, or they may be in the form of a spiral winding around the pipes. As these corrugated pipes are made in a great many different ways and from metals having corrugations of different sizes, it is very difficult to interconnect the adjacent ends of two pipes which are not made exactly the same, and to have on hand clamps suitable for the many different types of pipes.

The present invention overcomes these difficulties by providing a coupling comprising a wide substantially flat clamping band long enough to fit circumferentially around two aligned and butted grooved pipes, and having ends that come together. These ends may just abut, or they may overlap a little. Clamping means is provided on said ends of the band adapted to secure them together with the band tightly fitting around the aligned pipes. Projections extending inwardly from the band adjacent each of opposite edges thereof are arranged to fit in grooves in both pipes to prevent axial movement of the pipes when the band is tightened thereon. These projections are preferably in the form of dimples pressed out of the clamping band. These dimples are formed by a small stamping press or by the use of a hand setting punch, and they are formed where necessary to fit the corrugation or groove spacing of the two pipes to be connected. Thus, if the grooves or corrugations of the two pipes are of different



sizes, or extend at different angles relative to each other, the dimples can be pressed out where required in the band.

The dimple arrangement adjacent one edge of the band may be different from that adjacent the opposite edge thereof. The  
 5 dimples fit into the grooves or valleys of the corrugations of the pipes to prevent end movement thereof.

The pipe coupling is further improved by the use of clamping means which comprises two angle clamps longer than the width of the band. Each clamp includes a first leg having a slot therein  
 10 through which an end portion of the band extends, a heel adapted to bear against said band end portion, and a second leg connected to the first leg at said heel and projecting outwardly therefrom. Tightening means is connected to the second leg of both clamps and is adapted to draw said second legs together, causing the  
 15 heels of the clamps to press against their respective band end portions and prying outer edges of the first legs outwardly against said respective end portions. It is preferable to make the slots of the clamp longer than the width of the band so that when the tightening means is operated to connect the legs together,  
 20 the end portions of the bands can shift transversely relative to each other as the dimples of said bands fit into the grooves of the two pipes.

In an alternative form of the invention, the band is formed with an annular groove in the inner surface thereof substantially  
 .5 mid way between its edges. A gasket lying in this annular groove is wide enough to overlies the adjacent ends of the two pipes being connected together.

Examples of the pipe couplings are illustrated in the accompanying drawings, in which,

30 Figure 1 is a perspective view of one form of pipe coupling applied to the adjacent ends of two grooved or corrugated pipes,

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Figure 2 is a horizontal section taken on the line 2-2 of Figure 1 through the coupling and one of the pipes,

Figure 3 is an enlarged vertical section taken substantially on the line 3-3 of Figure 1, and

5      Figure 4 is a fragmentary sectional view similar to Figure 3 showing a coupling with an annular groove and gasket therein.

Referring to Figures 1 to 3 of the drawings, 10 is a pipe coupling according to this invention for securing adjacent and abutted ends of aligned pipes 12 and 13 together. Pipes 12 and 10 13 are respectively formed with annular or spiral grooves 16 and 17 therein.

Coupling 10 comprises a wide substantially flat clamping band 20 which is long enough to fit circumferentially around the ends of pipes 12 and 13, said band having ends 22 and 23 which 15 abut or overlap a little, as shown in Figure 2. Clamping means 26 is provided on the ends of band 20 and adapted to secure said ends together with the band tightly fitting around the two pipes. Projections extend inwardly from the band adjacent each of its opposite edges 28 and 29. These projections are preferably in 20 the form of dimples 31 and 32 of suitable size and shape pressed inwardly of the band near edges 28 and 29, respectively. Dimples 31 are arranged so that they will fit into a part of a groove 16 of pipe 12. Similarly, dimples 32 are arranged so that they will fit into part of a groove 17 in pipe 13. These dimples may be 45 formed by a small stamping press or by a hand setting punch so that they can be formed in band 20 in situ. As a result, clamp 20 is made to fit the two pipes being joined, regardless of the type of grooving in each pipe.

Clamping means 26 preferably comprises two identical clamps 30 36 which are longer than the width of band 20. Each clamp 36 comprises a first leg 38 having a transverse slot 39 therein

spaced inwardly from its outer edge 40. A second leg 43 is connected to the first leg and projects outwardly therefrom, said legs forming a heel 44 where they join the other. Suitable tightening means is provided for connecting legs 43 of the two clamps 36 together and drawing said legs towards each other. In this example, the tightening means comprises two bolts 45 extending through holes 46 in the two adjacent clamp legs 43, each bolt having a nut 48 threaded thereon.

End portions 50 and 51 of band 20 extend over legs 38 of the two clamps 36, through slots 39 of these legs and under heels 44 of the two clamps, see Figure 2. Although not absolutely necessary, it is preferable to form transverse grooves 55 and 56 in band end portions 50 and 51 into which the outer ends 40 of the respective clamps fit. This allows the inner surface of the outer end portion of each clamp leg 38 to lie flush with the inner surface of the adjacent portion of band 20, as shown in Figure 2. It will be noted that grooves of the clamps are longer than the width of band 20, see Figure 1.

When it is desired to connect the adjacent ends of pipes 12 and 13 together, after dimples 21 and 22 have been formed in band 20, the latter is wrapped around the adjacent pipe ends, and end portions 50 and 51 are directed through slots 39 of clamps 36 so that ends 22 and 23 of the band nearly abut or overlap each other. At this time, the outer edges 40 of the two clamps fit in the transverse grooves 55 and 56 of the band. Bolts 45 are inserted through holes 46 of clamp legs 43, and nuts 48 tightened on said bolts to draw the adjacent legs 43 towards each other to tighten the band on the pipes. This also causes heels 44 of the clamps to press against the end portions 50 and 51 of the band, while outer ends 40 of the clamps pry outwardly against the band to tighten it around the two pipe ends. As this takes place,

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dimples 31 and 32 embed themselves in the grooves 16 and 17 of the two pipes. As slots 39 are longer than the width of band 20, the end portions 50 and 51 of said band can shift transversely relative to each other as the dimples find their proper positions within the pipe grooves. When the band is drawn tightly around pipes 12 and 13 by the two clamps 36, dimples 31 and 32 prevent any axial movement of the two pipes relative to each other.

Figure 4 illustrates part of an alternative form of clamp 10a. This clamp has a band 20a similar to band 20, the only difference being that band 20a is formed with an annular groove 60 in its inner surface substantially mid way between its opposite edges 28 and 29. A wide gasket 62 lies in annular groove 60 and extends the length of band 20a.

With this arrangement, when band 20a is fitted around and tightened against pipes 12 and 13, gasket 62 overlaps the adjacent ends of these pipes to form a fluid-tight seal at said ends.

The embodiments of the invention in which an exclusive privilege or property is claimed are defined as follows:

1. A coupling for connecting together adjacent ends of annularly grooved pipes and the like of similar diameters, comprising a wide substantially flat clamping band long enough to fit circumferentially around two aligned and butted grooved pipes and having ends that come together, clamping means on said ends of the band adapted to secure said ends together with the band tightly fitting around the pipes, and a plurality of circumferentially-spaced dimples formed in the band and projecting inwardly therefrom adjacent each of opposite edges thereof, said dimples being arranged so as to fit in grooves in both pipes to prevent axial movement of the pipes when the band is tightened thereon.

2. A coupling for connecting together adjacent ends of annularly grooved pipes and the like of similar diameters, comprising a wide substantially flat clamping band long enough to fit circumferentially around two aligned and butted grooved pipes and having ends that come together, clamping means on said ends of the band and in the form of two angle clamps longer than the width of said band; each clamp including a first leg having a slot therein through which an end portion of the band extends, a heel adapted to bear against said band end portion, and a second leg connected to the first leg at said heel and projecting outwardly therefrom; tightening means connected to the second legs of both clamps to draw said second legs together, causing the heels of the clamps to press against their respective band end portions and prying outer edges of the first legs outwardly against said respective end portions, and projections extending inwardly from the band adjacent each of said opposite edges thereof and arranged to fit in the grooves in both pipes to prevent axial movement of the pipes when the band is tightened thereon.

3. A coupling as claimed in claim 2 in which said projections are in the form of dimples pressed out of the clamped band.



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4. A coupling as claimed in claim 1 or 2 including an annular groove formed in the inner surface of the band substantially mid way between the edges thereof, and a gasket lying in said annular groove wide enough to overlies the adjacent ends of said pipes.

5. A coupling as claimed in claim 2 in which said tightening means comprises at least one bolt extending through holes in said second legs, and a nut threaded on each bolt.

6. A coupling as claimed in claim 2 including a transverse groove formed in each of said end portions of the band and opening inwardly of the latter and in which fits said outer edge of the first leg of the clamp on said each end portion.

7. A coupling as claimed in claim 2 in which the slot in the first leg of each clamp is longer than the width of said band.

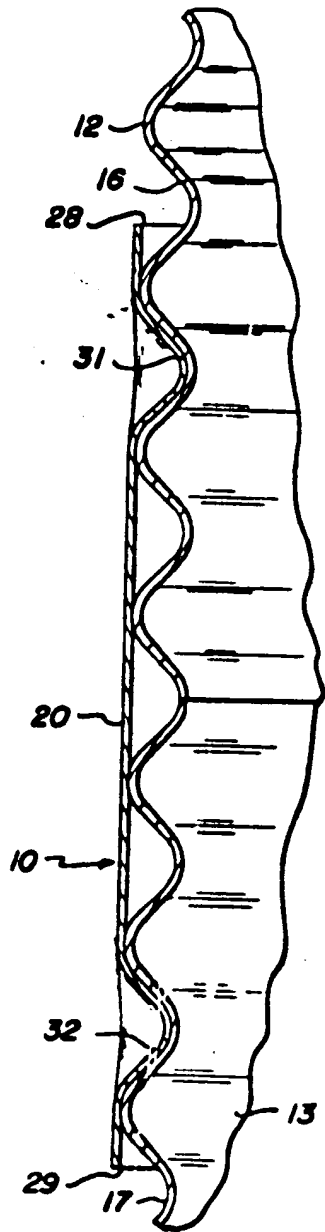


Fig. 3.

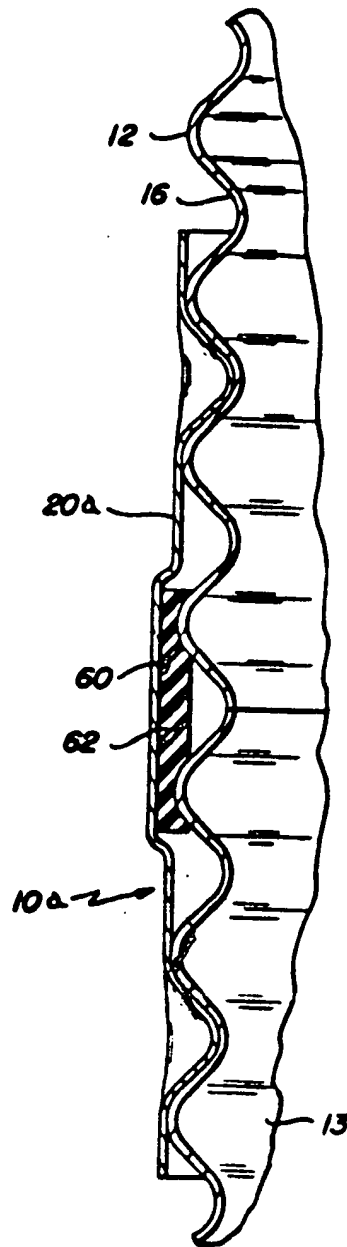


Fig. 4.

# GROOVED PIPE COUPLING

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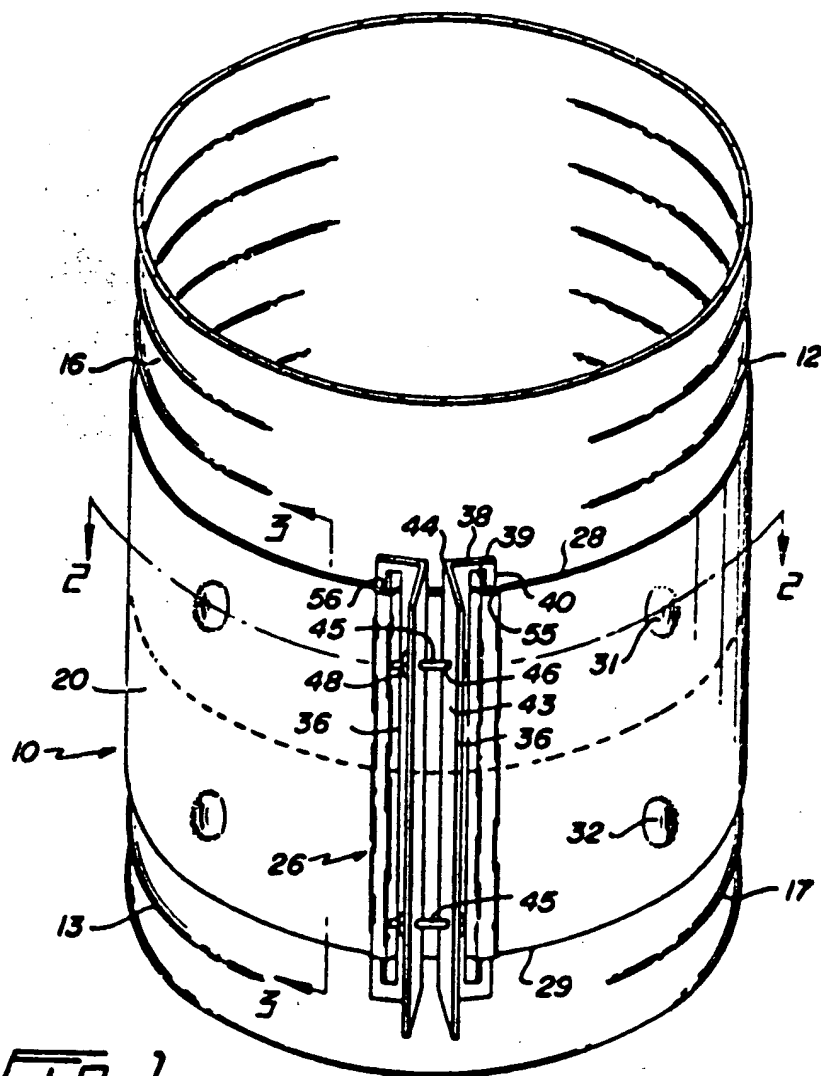


FIG. 1.

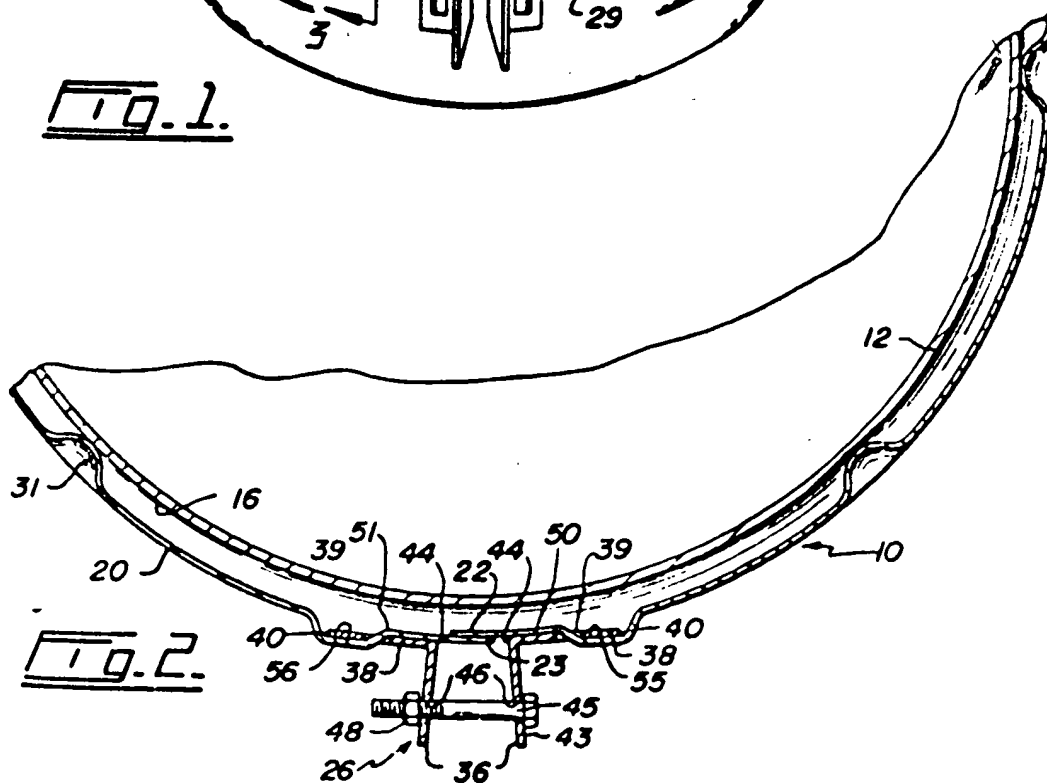


FIG. 2.